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Introduction

Banks play a central role in the transmission of monetary policy to the economy. A key instrument in this process is the policy interest rate for banks set by the central bank (Kashyap & Stein, 2000). When a central bank raises interest rates, the spread between the policy rate and the deposit rate increases. This increase is driven by banks' market power, which allows them to pass on rate hikes to depositors only partially, causing deposit outflows. Conversely, if the interest rate set by a central bank is low, deposits effectively compete with cash. Since cash offers a zero return, banks are constrained to keep deposit spreads narrow to remain competitive. This is called the deposit channel of monetary policy (Drechsler, Savov and Schnabl, 2017).

However, the deposit structures of banks differ, which alters the effect of monetary policy. Drechsler, Savov and Schnabl (2017) show that when the Fed funds rate rises, the impact varies across deposit types. In particular, while the growth rate of core deposits is strongly negatively related to changes in the Fed funds rate, this effect is even stronger for checking deposits, whereas the opposite relationship holds for small time deposits (Drechsler, Savov & Schnabl, 2017). This raises the central research question of this study: 'Are banks with certain deposit profiles more exposed to interest rate risk during periods of monetary tightening?'

This question has both theoretical and practical relevance. Theoretically, it contributes to the literature on the deposit channel of monetary policy by examining how specific deposit compositions influence transmission. While the general mechanism is understood, there is limited research on how distinct deposit structures, specifically the mix of insured versus uninsured funds, affect bank stability. Practically, the findings are critical for policymakers. As highlighted by recent banking instability, understanding these risks is essential for maintaining financial stability.

Prior research has mainly focussed on the concept of maturity mismatch. This refers to the banking practice of funding long term assets holding a fixed rate with short term deposits. According to Flannery and James (1984), this discrepancy makes banks vulnerable to changes in interest rates. However, recent research by Drechsler, Savov and Schnabl (2021) suggests that maturity mismatch actually hedges banks against this risk rather than exposing them to it. They emphasize that retail deposits, which comprise approximately 70 percent of bank funding, provide a stable foundation that insulates banks from rate volatility. Nevertheless, the banking turmoil of 2023 exposed the limits of this protection, indicating that the deposit hedge fails when banks rely heavily on uninsured funding. Recent studies by Jiang et al. (2023) and Koont, Santos, and Zingales (2023) find that unlike insured retail depositors, uninsured depositors are highly sensitive to solvency concerns and can withdraw funds rapidly via digital platforms.

H1: *Banks with higher concentrations of uninsured deposits exhibit significantly greater exposure to interest rate risk during periods of monetary tightening.*

Methodology and Data

This paper combines regulatory bank-level data with macroeconomic interest rate data to examine whether banks with different deposit structures are differentially exposed to interest rate risk during periods of monetary tightening. The primary data source is the Federal Financial Institutions Examinations Council (FFIEC) Call Reports, which provide quarterly balance sheet and income statement information for all U.S. commercial banks. The sample covers the period 2010–2025, allowing for an analysis of multiple monetary policy regimes, including both gradual and aggressive tightening cycles.

Specifically, the analysis focuses on the tightening cycles from December 2015 to December 2018 and from March 2022 to July 2023.

From the Call Reports, we construct several key variables to capture banks' deposit structure, deposit pricing behavior, and interest income performance. First, to proxy for banks' reliance on stable versus rate-sensitive funding, the share of non-interest-bearing deposits is calculated as:

$$DepositProfile_{i,t} = \frac{Non\ interest-bearing\ deposits_{i,t}}{Total\ deposits_{i,t}}$$

A higher value indicates a greater reliance on deposits that are typically less sensitive to interest rate changes and slower to reprice. Second, to capture how banks adjust deposit rates in response to market changes, we construct an implicit deposit rate:

$$DepositRate_{i,t} = \frac{Interest\ expense\ on\ deposits_{i,t}}{(Interest-bearing\ deposits_{i,t-1} + Interest-bearing\ deposits_{i,t})/2}$$

This variable reflects the effective cost of deposit funding and serves as a proxy for banks' deposit repricing behavior during tightening periods. Third, as the main outcome variable, we use a Net Interest Margin proxy, defined as:

$$NIM_{i,t} = \frac{Net\ interest\ income_{i,t}}{Total\ assets_{i,t}}$$

This captures an earnings-based measure of interest rate exposure, reflecting how banks' interest income and funding costs adjust to changes in policy rates over time. We also include standard bank-level controls such as bank size (log total assets), capitalization (equity-to-assets), asset composition, and profitability.

Monetary tightening is measured using the Effective Federal Funds Rate, obtained from the Federal Reserve Economic Data (FRED) database. Daily observations for 2010–2025 are aggregated to quarterly averages to match the frequency of the bank-level data. Tightening periods are identified as quarters in which the federal funds rate increases, with particular focus on the 2015–2018 and 2022–2023 tightening cycles.

Econometric model

To isolate the impact of funding structure on interest income stability, we estimate a panel regression model with fixed effects. Following the standard approach in the literature, our baseline specification is defined as:

$$NIM_{i,t} = \alpha_i + \beta(DepositProfile_i \times Tightening_t) + \Gamma X_{i,t-1} + \delta_t + \varepsilon_{i,t} \qquad (1)$$

where $NIM_{i,t}$ refers to the Net Interest Margin proxy; $DepositProfile_i$ is the bank's funding structure measure prior to tightening; $Tightening_t$ is a dummy variable equal to one during monetary tightening periods; $X_{i,t-1}$ is a vector of lagged bank controls; subscripts i and t denote bank and time, respectively; α_i captures bank-specific fixed effects to control for time-invariant heterogeneity; and δ_t captures time fixed effects to control for common macroeconomic shocks.

The coefficient of interest (β) captures whether banks with certain deposit profiles experience a differential change in net interest income during tightening periods. Because deposit structure is measured before tightening, differences in outcomes can be interpreted as differential exposure to interest rate risk rather than endogenous balance-sheet adjustment.

The identification exploits cross-sectional variation in banks' pre-determined deposit structures which are then interacted with market wide monetary tightening episodes. The coefficient of interest captures the heterogeneous responses of net interest margins to tightening across banks with different deposit profiles. The deposit structure is measured prior to tightening; hence the interaction reflects differential exposure to interest rate risk rather than endogenous balance-sheet adjustment. The identifying assumption is that in the absence of monetary tightening, banks with different deposit profiles would have exhibited parallel trends in net interest margins, conditional on bank and time fixed effects and lagged controls.

As monetary tightening affects all banks simultaneously, identification relies on cross-sectional differences in exposure arising from pre-determined deposit profiles rather than from differential treatment assignment. A key threat is systematic NIM trend differences across deposit structures outside tightening cycles, due to business models, market power, or risk-taking. Such pre-trends could bias the interaction toward pre-existing dynamics instead of causal exposure to interest rate changes.

To address this, an event-study tests for different pre-trends by replacing the tightening indicator with leads and lags around tightening onset. The absence of significant coefficients in the pre-tightening periods provides evidence that NIMs evolved similarly across banks with different deposit structures prior to monetary tightening, lending support to the parallel trends assumption. Furthermore, placebo tests use fictitious tightening periods or shifted actual episodes to no-policy times; no differential NIM responses there confirm effects are policy-driven, not slow-moving correlations.

These tests enable causal interpretation: it demonstrates that the deposit structure predicts NIM changes only during monetary tightening.

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